

Nalco Docket No.: 7560-NES  
Customer No. 000049459

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**REMARKS**

This is in reply to the Final Office Action mailed on May 10, 2007 ("Office Action").

Claims 3-14, 16-40, 42-53 and 55-63 are currently pending.

Claims 42-46, 48-52 and 55-59 are allowed.

Claims 37-40 47 and 53 are objected to as being dependent on a rejected base claim.

Claims 3-4, 6-14, 16-26, 47, 53 and 63 are rejected under 35 U.S.C. § 112, second paragraph.

Claims 3, 5-10, 16, 18-23 and 60-63 are rejected under 35 U.S.C. § 102(b) over U.S.

5,324,404 ("Ott").

Claims 6-10, 18-23 and 27-36 are rejected under 35 U.S.C. § 103(a) over U.S. 5,324,404 ("Ott").

Claims 28, 43, 47, 51, 53, 61 and 63 are amended to particularly point out and distinctly claim subject matter which Applicant regards as his invention.

No new matter is added by this amendment.

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DISCUSSIONClaim Interpretation

Applicant agrees with the Examiner that the claims are drafted in product by process format. With regard to claims 3-14, 16-40, 42-53 and 55-63, Applicant respectfully asserts that closed language is used with respect to the amine containing monomer such that amine compounds having more than two reactive amino hydrogen atoms are excluded and with respect to the epoxide-containing monomer such that epoxide-containing species that comprise aromatic groups are excluded. With respect to obvious reactants, Applicant respectfully asserts that any disclosure in the cited reference, which concerns grinding aids is irrelevant to the claimed subject matter.

The Rejections under 35 U.S.C. § 112, Second Paragraph

Claims 3, 4, 6-14, 16-26, 47, 53 and 63 are rejected under 35 U.S.C. § 112, second paragraph. In particular, the Examiner states:

Claims 18-26 are indefinite since it is unclear what is applicants intended materials since the claim requires an amine capping monomer and an amine alkylating agent agents, i.e., said amine capping monomer would no longer be an amine capping monomer but a polymeric amine. The amine capping agents are not distinct from the amine reactants of claim 61 or 62. Thus, the ratio defined therein is unclear since it is unclear how much of the amines should be attributed to the ratio that are the amine reactants of claims 61 or 62 and how much of the amine capping agents, wherein both read on the same materials

In claims 3 and 16, "terminal epoxy groups" lacks proper antecedent basis.

In claim 47, it is unclear what said compound is effective. Therefore, said amount is indefinite.

In claim 53, the species  $\text{CH}_3\text{O}(\text{CH}_2\text{CH}_2\text{O})_n-(\text{CH}_2\text{CRHO})_n-\text{CH}_2-\text{CH}(\text{CH}_3)-\text{NH}_2$ , is unclear since both subscripts are "n" when R is H, it is unclear how the skilled artisan would determine a ratio.

Claim 63 contains misspelled terms for "glycidyl" and "said glycidyl compound" lacks antecedent basis.

Office Action at pages 2-3.

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Applicant respectfully traverses this rejection.

With regard to claims 18-26 and 63, Applicant has amended claims 61 and 63, from which claims 18-26 depends to recite that the oligo-and polymeric reaction product comprises terminal epoxide groups which are capped by subsequent reaction of the terminal epoxide groups. See claim 16, from which claim 18 depends and specification at page 10, lines 10-29 and Examples 33, 35, 40, 43 and 45.

The Examiner is correct that the capping amine may in some instances be the same as the amine containing only two reactive amino hydrogens which is incorporated in the polymer backbone. The difference is when the reaction with the capping amine occurs and the structure of the resulting polymer. When used as a capping agent, the amine is added to the already formed polymer to react with terminal epoxide groups and thereby improve the properties of the capped polymer compared to the uncapped polymer. The end result is a polymer in which terminal epoxide groups are converted to secondary or tertiary amine end groups.

For the reasons discussed above, Applicant respectfully asserts that claims 18-26 and 63, when read in light of the specification and amendment to claim 63 particularly point out and distinctly claim the subject matter of the invention. Accordingly, Applicant respectfully requests withdrawal of the rejection of claims 18-26 under 35 U.S.C. § 112, second paragraph.

With respect to claims 3 and 16, applicant respectfully asserts that proper antecedent basis for "terminal epoxy groups" is provided by the amendment to claims 61 and 63.

With respect to claim 47, "effective amount" has been deleted.

With respect to claim 53 (and also claim 43), species  $\text{CH}_3\text{O}(\text{CH}_2\text{CH}_2\text{O})_n-(\text{CH}_2\text{CRHO})_n-\text{CH}_2-\text{CH}(\text{CH}_3)-\text{NH}_2$  has been deleted.

Finally, with respect to claim 63, the spelling error is corrected. Antecedent basis for "said glycidyl compound" is found in line 4.

In light of the foregoing, Applicant respectfully asserts that claims 3, 16, 47, 53 and 63 particularly point out and distinctly claim the subject matter of the invention. Accordingly, Applicant respectfully requests withdrawal of the rejection of claims 3, 16, 47, 53 and 63 under 35 U.S.C. § 112, second paragraph.

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**OFFICIAL**The Rejection of Claims 3, 5-10, 16, 18-23 and 60-63 under 35 U.S.C. § 102(b) over U.S. 5,324,404

Claims 3, 5-10, 16, 18-23 and 60-63 are rejected under 35 U.S.C. § 102(b) over U.S. 5,324,404 ("Ott"). In reply to Applicants arguments in the reply dated February 28, 2007 that Ott discloses different a different composition, the Examiner states:

13. Applicants (page 19) assert that the new claims, 61-63, exclude resins comprising an aromatic group in the backbone. This has not been deemed persuasive for the following reasons. Initially, (1) the claims are drafted in product-by-process format and do not set forth any structure. (2) The claims employ open transitional language, i.e., "comprising", which is open to elements of the claims that are not explicitly set forth in the claim. Since the Ott reference discloses both the epoxide or glycidyl compounds of aliphatic compounds and aromatic compounds, applicants amended new claims are not deemed to exclude the materials of the Ott reference.

14. Applicants (page 19) assert that claim 60 is different from the Ott materials because when 60(3) R8 is 2-hydroxy-3-chloropropyl, which contains only one reactive site with an amine and 60(2) has two, one on each end of the polyoxyalkylene group. Applicants assert the materials resulting from claim 60 have polyoxyalkylene in the polymer backbone. This has not been deemed persuasive since the claims merely require reaction without sequence or concentration. Applicants' assertions of structure has not been shown to be a necessary result of the claims product by process. Thus applicants' arguments are not commensurate in scope with the claims. Applicants have the burden of showing the claims distinguish over the prior art. See MPEP 2113.

15. Applicants (page 19) further assert that 60(3), due to one reactive site cannot be used to grow a polymer chain. Applicant's claims do not define a degree of polymerization. Applicants characterization (pages 7 and 8) of the instant specification) of aliphatic or cycloaliphatic epoxides or glycidyl compounds clearly includes glycol ethers as examples aliphatic or cycloaliphatic compounds.

16. Applicants' characterization (pages 7 and 8 of the instant specification) of aliphatic or cycloaliphatic epoxides or glycidyl compounds clearly includes glycol ethers as examples of aliphatic or cycloaliphatic compounds. Please compare claim 5, which includes a polyether as an aliphatic compound.

Office Action at pages 7-8.

Applicant respectfully traverses this rejection.

Applicant has amended claims 61, 62 and 63 to expressly recite oligo- and polymeric polymeric reaction products of an epoxide or glycidyl compound, or a mixture thereof, where the epoxide or glycidyl compound is selected from the group consisting of aliphatic or cycloaliphatic compounds having two reactive epoxide groups, thereby excluding the resins disclosed by Ott, all of

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which must comprise an aromatic-group containing polymer backbone. Thus, Applicant respectfully asserts that while the composition of claims 61-63 may contain additional ingredients, the oligo- and polymeric materials must be derived solely from the recited epoxides or glycidyl compounds and amines.

As all of the grinding resins of Ott incorporate diglycidyl ether of bisphenol A, which is expressly excluded from the claimed polymers, Applicant respectfully asserts that claims 61-63, and claims 3, 5-10, 16, 18-23 which depend therefrom are novel over Ott and therefore respectfully requests withdrawal of the rejection under 35 U.S.C. § 102(b) over Ott.

Applicant has amended claim 60 to clearly recite a two-step sequence in which 60 1) and 60 2) are first reacted to form a polymeric material, which is then alkylated by reaction with 60 3). This sequence results in the introduction of branching along the polymer backbone by grafting through displacement of the halogen atom in the epihalohydrin by nitrogen atoms in the polymer chain. See specification at page 11, line 10 to page 12, line 6.

Accordingly, Applicant respectfully asserts that claim 60 recites a polymer in which the polyoxyalkylene group of the alkylating agent is grafted onto the polymer chain rather than incorporated into the polymer chain. Applicant respectfully asserts that this grafting reaction of a pre-formed polymer chain, and corresponding introduction of branching is not disclosed by Ott.

Accordingly, Applicant respectfully asserts that as Ott discloses a different process and results in the preparation of a different polymer the rejection of claim 60 are under 35 U.S.C. § 102(b) over Ott must be withdrawn.

The Rejection of Claims 6-10, 18-23 and 27-36 under 35 U.S.C. § 103(a) over U.S. 5,324,404

Claims 6-10, 18-23 and 27-36 are rejected under 35 U.S.C. § 103(a) over U.S. 5,324,404 ("Ott"). In particular, the Examiner states:

...Ott et al (columns 9-12, grinding resins A1-A6 disclose polymer resin compositions employing DER 732 (polypropylene glycol diglycidyl ether from Dow Chemicals) reacted with 2,2'-aminoethoxyethanol ( $\text{H}_2\text{NCH}_2\text{CH}_2\text{OCH}_2\text{CH}_2\text{OH}$ ) and N,N-dimethylaminopropylamine ( $(\text{CH}_3)_2\text{NCH}_2\text{CH}_2\text{NH}_2$ ).

Ott et al differs from the claims in the use of a particular polyglycidyl ether, complete reaction of the polyglycidyl ether to form the same reaction product of N-

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alkylating agents when the N-alkylating agents are capped with 2-hydroxy-3-chloropropyl, or the residual by-product chloride or bromide resulting from N-alkylating agents are capped with 2-hydroxy-3-chloropropyl.

Ott et al (column 6, lines 27 et seq; particularly lines 55 and 62-65) disclose a number of polyglycidyl ether or polyepoxides including but not limited to those derived from epihalohydrins, glycerol, and polyepoxide derived from the epoxidation of olefins.

It would have been obvious to one of ordinary skilled in the art at the time of applicants' invention to employ the polyglycidyl ether or polyepoxides taught in the Ott et al reference as obvious functional equivalent to the DER 732 or the epoxy resins exemplified.

To the extent the Ott et al reference differs in that the reaction of the polyglycidyl ethers are incomplete, less than 100%, or the compositions contain some residual by-product halogen, the Ott et al reference teaches the use of alternative polyglycidyl ethers and/or polyepoxides derived from epihalohydrins. It would have been obvious to one of ordinary skilled in the art at the time of applicants' invention to employ the materials derived from epihalohydrins as an obvious equivalent to the polyglycidyl ethers and/or polyepoxides exemplified, which would have resulted in polymer compositions having the same or substantially the same structure. See MPEP 2113.

Office Action at pages 5-6.

Applicant respectfully traverses this rejection.

As discussed above, Applicant has amended claims 61 and 63 to expressly exclude the incorporation of glycidyl ethers of polyphenols as required in all instances by Ott.

As noted previously, Applicant cannot locate any disclosure in Ott relating to capping monomers or N-alkylating agents.

Applicant further respectfully asserts that nothing in Ott teaches or suggests preparing a polymer which does not incorporate glycidyl ethers of polyphenols and which does incorporate the claimed combination of diglycidyl ethers, amines containing only two reactive hydrogen atoms, capping monomers and/or N-alkylating agents and the claimed reaction sequence. Applicant therefore respectfully requests withdrawal of the rejection of claims 6-10, 18-23 and 27-36 under 35 U.S.C. § 103(a).

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CONCLUSION

Applicant respectfully request entry of this clarifying amendment and withdrawal of the rejections under 35 U.S.C. §§ 112, second paragraph, 102(b) and 103(a) and respectfully assert that this application is in condition for allowance. Early notice to this effect is earnestly solicited. In the event that the Examiner believes that further amendment or clarification is required, Applicant respectfully requests that the Examiner contact applicant to further discuss this application prior to issuing an advisory action.

Respectfully submitted,



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